

EXPLANATION OF SIGNIFICANT DIFFERENCES

BOMARC Missile Accident Site McGuire Air Force Base, New Jersey

Site Name: Boeing Michigan Aeronautical Research Center (BOMARC) Missile Accident Site

Site Location: McGuire Air Force Base, Plumsted Township, Ocean County, New Jersey

Lead Agency: U.S. Air Force

Support Agencies: United States Environmental Protection Agency, Region 2 (U.S. EPA) and New Jersey Department of Environmental Protection (NJDEP)

I. Statement of Purpose

On November 16, 1992, the Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health) signed a Record of Decision (ROD) for the BOMARC Missile Accident Site that addresses the excavation and off-site disposal of low-level plutonium waste. The ROD and a concurrent Environmental Impact Statement determined that the Air Force would remove the contaminated soil and debris from the BOMARC site and would transport and dispose of that soil and debris "in an appropriate, off-site radioactive waste disposal facility."

The cleanup of the BOMARC site is being carried out in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended, 42 USC §§ 9601 et seq.; the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300; the Defense Environmental Restoration Program Act (DERP), 10 USC §§ 2701 et seq.; Department of Defense (DoD) Directive 4715.7, *Environmental Restoration Program* (May 21, 1996), and Air Force Instruction 32-7020, *The Environmental Restoration Program* (7 February 2001).

This Explanation of Significant Differences (ESD) is issued in accordance with Section 117(c) of the CERCLA of 1980, as amended, 42 USC § 9617(a) and the NCP, 40 CFR § 300.435(c)(2)(i) and § 300.825(a)(2). This ESD has been prepared to provide the public with an explanation of the nature of a change which has been made to the selected remedy set forth in the ROD; to summarize the information that led to the making of the change; and to affirm that the revised remedy complies with the statutory requirements of CERCLA section 121, 42 USC § 9621. The selected remedy does not fundamentally alter the remedy or performance of the remedy, and therefore a ROD

amendment is not required. This ESD is incorporated into the Administrative Record for the Site.

Since the publication of the ROD, several key elements of the selected remedy set forth in the ROD were either changed or expanded. First, a waste characterization published subsequent to the ROD in 1998 increased the estimate of the volume of the contaminated soil and debris present at the site from 7,262 to 12,500 cubic yards (cu yds). Second, the selected disposal facility was changed to Envirocare of Utah, Inc. from a “Department of Energy (DOE) disposal facility” as originally proposed in the ROD. Third, it was determined that two missile shelters at the site should be demolished and removed in addition to the shelter that was destroyed in the June 1960 fire. Fourth, the contaminated soil and debris will be transported through Fort Dix and Naval Air and Engineering Station (NAES) Lakehurst by truck and then transferred onto rail cars at NAES Lakehurst for transportation to the disposal facility. Originally, the contaminated soil and debris was to be shipped entirely via trucks to the disposal facility. Subsequently, it was determined to be both safer and more cost effective to truck the contaminated soil and debris to a rail transfer facility for placement in railroad cars for shipment to the disposal facility.

These significant differences to the original selected remedy are consistent with the intent of the original ROD—that is, the contaminated soil and debris are being moved by truck to a transfer facility for ultimate transshipment to a disposal facility. Although the increased volume of contaminated soil and debris, the change in the disposal facility, and the routing of the contaminated soil and debris through Fort Dix and NAES Lakehurst do not fundamentally alter the original remedy selected, they do constitute a significant change to the selected remedy set forth in the ROD.

II. Summary of the Site History, Site Conditions, and Selected Remedy

A. Site History and Conditions

The BOMARC facility occupies approximately 218 acres just east of Ocean County Route 539, in Plumsted Township, Ocean County, New Jersey. The facility is approximately 11 road miles east of McGuire AFB and is contained within the Fort Dix Military Reservation on land permitted to the Air Force.

The Air Force built rows of shelters to house nuclear warhead-equipped BOMARC missiles at this facility during the 1950s and 1960s. The Air Force deactivated the facility in 1972 after they removed all missiles from the shelters. Although the facility is inactive, it remains under Air Force jurisdiction.

On June 7, 1960, an explosion and fire occurred in BOMARC Missile Shelter 204. The force of the explosion destroyed portions of the shelter roof, causing flames to rise to 20 feet and causing black smoke to blanket the area. Initially, the fire burned uninhibited for about 30 minutes. Firefighters sprayed the area with water from fire

hoses for approximately 15 hours as part of the fire-fighting activities. As a result, plutonium-contaminated water flowed under the front door of Missile Shelter 204, down the asphalt apron and street, and into the drainage ditch leading outside the site boundary. At one point during fire-fighting efforts, responding personnel constructed an earthen dam across the ditch to contain the contaminated water. The drainage ditch runs in a southerly direction from Missile Shelter 204 and parallels the site boundary fence for several hundred feet before it enters a series of underground culverts and eventually crosses underneath Ocean County Route 539. From this point, the culvert opens into a sandy ditch that eventually flattens into a wooded area.

Although no nuclear explosion took place, the nuclear warhead, which contained plutonium, enriched uranium, and bottled tritium, burned and partially melted. The fire destroyed the missile and badly damaged the missile shelter. The explosion displaced the oxidizer tank; yet it remained intact. Residue from the burning warhead contaminated the concrete floor. In addition to the severely damaged roof, flying fragments of the helium and fuel tanks pitted the floor and concrete walls. The accident also deformed the steel roof beams and caused heat damage to the shelter walls.

Air Force procedures in effect at the time of the accident included removal of contaminated debris from the shelter for disposal as waste. Existing records indicate that additional radioactive waste from the site was disposed at the Idaho National Engineering and Environmental Laboratory. Records also indicate that they applied containment measures to the missile shelter and the asphalt apron.

During the fire, tar melted and spread in a thin layer onto sections of the floor of Missile Shelter 204. Several sections of the floor containing tar showed alpha radiation readings of over 2,000,000 counts per minute (cpm). Alpha radiation levels in the center of the road outside the shelter were also 2,000,000 cpm. The Air Force again washed down the entire area with water and then allowed it to dry. Presumably, the wash water drained into the drainage ditch.

After the area was completely dry, the Air Force spray-painted the inside of the shelter to immobilize the alpha radiation-emitting contaminant and painted the outside area. After the paint dried, the radioactivity readings were taken again. Areas that had previously shown 2,000,000 cpm then showed 0 cpm, due to the shielding effect of the paint layer on the plutonium. Some of the fringe areas, however, showed readings ranging from 50 to 500 cpm.

Shortly after the 1960 missile accident, explosive ordnance personnel from Fort Dix, New Jersey and Griffiss AFB, New York recovered seven containers of plutonium. The DOE conducted measurements of the recovered material. The amount of plutonium in the warhead remains classified. However, DOE and Air Force scientists prepared an unclassified account of the disposition of the recovered material during that period. The account indicates that the estimate of the upper limit of the plutonium that could be on-site is 300 grams. A characterization study published in 1998 supports this conclusion.

Later in June 1960, the Air Force poured 4 inches of reinforced concrete over the asphalt apron in front of Missile Shelter 204 to fix the plutonium contamination under a protective overburden. In addition, they placed 2 inches of asphalt along the bottom of the drainage ditch located inside the site boundary fence and added an additional 2 inches of concrete to a small portion of the shelter apron area in 1967. They filled the pit area inside Missile Shelter 204 with soil excavated from the rear of the shelter.

B. The ROD's Selected Remedy

The major components of the selected remedy addressed by the November 1992 ROD are:

- Excavation of source soils containing greater than 8 picocuries per gram (pCi/g) of plutonium. This will limit the maximum risk to any future resident of the site to a level on the order of one in 10,000 excess cancer risk, a level considered acceptable by U.S. EPA.
- Excavation and sectioning of contaminated portions of the concrete apron, utility bunkers and the missile shelter.
- Excavation and removal (if found) of the missile launcher.
- Containerization, transport, and disposal of radioactive materials in an off-site facility designed for long-term management of contaminated soil and debris.
- Restoration of the site by backfilling with clean fill as needed followed by grading and revegetation of the site with indigenous plant species.

ROD at Pp. 6 - 7.

III. Description of Significant Differences

Since the publication of the ROD in 1992, several key elements of the selected remedy were either changed or expanded. The Site Operations Work Plan for the BOMARC Missile Plutonium Remediation Project at McGuire AFB, NJ (Work Plan) details the exact procedures for all work associated with the BOMARC remediation project. Its purpose is also to ensure safe, effective and efficient execution of the project. There are several differences between the elements to the selected remedy as described in the original ROD and the Work Plan. The ROD estimated the extent and magnitude of

contaminated soil, sediment and pavement at the site at 7,262 cu yds (ROD at p. 33), while the current estimate used in the Work Plan is 12,500 cu yds (Work Plan at sec. 3.4.4.2). The ROD also estimated the depth of plutonium concentration greater than 8 pCi/g to be generally found to be less than one foot across the site (ROD at p. 33); while the June 1998 Final Site Characterization Report used by the Work Plan estimates maximum depth of contamination requiring excavation is 24 feet (Work Plan at sec. 3.4.4.4). The ROD also envisioned transportation of the contaminated soil and debris by trucks to a Department of Energy disposal facility (ROD at p. 65), while the Work Plan calls for the contaminated soil and debris to be trucked to a rail facility, transported cross-country by rail, and then disposed of at the facility of Envirocare of Utah, Inc. (Work Plan at secs. 1.1, 3.4.6, and 3.4.7). The significant changes also include the improvement of the haul routes through Fort Dix and NAES Lakehurst and the reconstruction of a rail spur and the commercial gate on NAES Lakehurst. (Work Plan at Appendix D.)

The Air Force has determined that a change in the remedy set forth in the ROD is warranted. This change is a significant change as defined in the NCP at 40 CFR § 300.435 (c)(2)(i); therefore, preparation and publication of an ESD is required. Amendment of the ROD is not required. It does not require a modification to the ROD since the change does not fundamentally impact the scope, performance, or cost of the remedy.

A. Detailed Description of Significant Differences

1. Volume of Contaminated Soil and Debris. The ROD characterized the volume of contaminated soil and debris at the site based upon data collected and analyzed prior to November 1992. The ROD states that the selected remedy would involve excavation and off-site disposal of approximately 7,262 cu yds of contaminated soil and pavement (ROD at page 33). However, based upon the June 1998 Final Site Characterization Report, the Work Plan addresses the plans for the removal and disposal of an “estimated approximately 8,000 to 12,500 cubic yards of soil and concrete” (Work Plan at sec. 3.4.4.2). The ROD estimated that the maximum volume of waste material to be removed from the BOMARC site is 402 cu yds (ROD at page 66). The Work Plan, based on the June 1998 Final Site Characterization Report, states that there is an estimated 439 cu yds of building debris that will require disposal (Work Plan at sec. 3.4.3.3). The ROD states that the “depth of plutonium concentration greater than 8 pCi/g was generally found to be less than one foot across the site” (ROD at page 33). However, based upon the June 1998 Final Site Characterization Report, the Work Plan estimates the maximum depth of contamination requiring excavation is 24 feet, in limited area with most excavation less than 3 feet (Work Plan at sec. 3.4.4.4).

2. Disposal Facility. The ROD evaluated two radioactive waste disposal facilities for the proposed disposal of the contaminated soil and debris. These facilities were the US Ecology's Hanford Site in Washington State and the Department of Energy's Nevada Test Site (ROD at Pp. 64 –65). However, the Air Force as the lead agency, through the U.S. Army Operations Support Command, has arranged for the contaminated soil and debris to be disposed at Envirocare of Utah, Inc. facility under a separate contract, #DAWCW41-98-D-9003. The ROD stated that trucking was selected as the preferred

mode of transporting the contaminated soil and debris to the disposal facility (ROD at Pp. 65 – 66). However, the Work Plan and the accompanying Appendix D Waste Management and Disposal Plan call for the contaminated soil and debris to be transported by trucks and then loaded onto trains for shipment to the Envirocare of Utah, Inc. disposal facility with the majority of transport to be by rail. The ROD does not address transporting the contaminated soil and debris across Fort Dix and NAES Lakehurst and loading it onto rail cars on NAES Lakehurst. The Work Plan, however, states that the contaminated soil and debris will be transported across Fort Dix and NAES Lakehurst and transferred onto rail cars on NAES Lakehurst (Work Plan, Appendix D. at sec. 6.11.3). This will also require the reconstruction of a 3,000-foot rail spur and a new commercial gate onto NAES Lakehurst.

3. Demolition of Shelters. The ROD stated that only one missile shelter structure (Missile Shelter 204) would be demolished (ROD at p. 7). However, the Work Plan states that the two adjacent shelter structures (Shelters 202 and 206) in addition to the primary shelter at the site will be demolished to facilitate the soil excavation (Work Plan at sec. 3.4.4.3).

B. Detailed Description of Road Improvements, Rail Spur Reconstruction, and Construction of New Commercial Gate

A truck-to-rail car transfer facility will be constructed within the NAES Lakehurst fence. The transfer facility will be parallel and adjacent to the north edge of Hancock Road, just inside the Commercial Gate. The facility will consist of 870 feet of railroad track, a truck staging area, transfer area, and a mobile crane to transfer the Intermodal Containers from the trucks to the rail cars. A gravel area adjacent to the rail spur will be constructed for the staging of trucks adjacent to the rail cars. The following actions will be taken to improve the truck haul roads and to reconstruct a rail spur and waste transfer area on NAES Lakehurst:

1. Remove and replace approximately 1,800 feet of existing railroad tracks and ties. This existing rail spur is on NAES Lakehurst property, outside the NAES Lakehurst fence. Reconstruction activities at the rail spur site will not extend more than 50 feet from the Navy-owned rail spur right-of-way, and therefore have no effect on the existing populations where potential habitats for the *Chrysopsis falcate* (Sickle-leaf golden-aster), a Pinelands endangered plant species, and the *Pituophis melanoleucus melanoleucus* (Northern pine snake), a state designated threatened species are believed to be located. The Air Force contractors have been instructed to watch for the presence of, to report any sightings of, and to protect both species from harm. If either species is sighted, appropriate protective measures will be taken.

2. Add approximately 1,200 feet of new tracks and ties to connect the rail spur to the railroad main line and extend the rail spur into NAES Lakehurst. Approximately 200 feet of new track will connect this rail spur to the railroad main line in Lakehurst NJ. This replaces the rail spur removed sometime in the past. Approximately 1,000 feet

of new track will extend the rail spur across Route 547 and into the fenced portion of NAES Lakehurst about 870 feet.

3. Add a gate to the east side of the existing Commercial Gate to allow the rail spur to penetrate the fence around NAES Lakehurst.
4. Within NAES Lakehurst, prepare a strip of land approximately 50 feet wide and approximately 900 feet long adjacent to the east side of Hancock Road. A total of 9 mature trees will be removed. Of these 9 trees, 4 are 12" in diameter, 1 is 8" in diameter, 1 is 6" in diameter, and 3 more are 4" in diameter. All cut trees and trimmed limbs will be collected and deposited in the compost facility on NAES Lakehurst per direction of the on-site forester. Most loading activity will occur from the road. This area will provide space for construction of the rail spur transfer facility. In order to prepare the area, selected pine trees will be removed. The entire 50 feet by 900 feet area will be graded, compacted, and receive gravel where needed to allow construction of the rail spur and transfer facility. NAES Lakehurst will lose the use of the running trail for the duration of the project.
5. Compact the sand and place gravel adjacent to the rail spur sufficient for the trucks and mobile crane to drive across.
6. Before moving the waste from the BOMARC facility to the rail spur transfer facility, grade, compact, spread gravel on the haul roads, as needed, to allow truck traffic. As needed during the waste removal project, maintain the haul roads sufficiently to allow continued safe use.
7. Before moving the waste from the BOMARC facility to the rail spur transfer facility, trim trees and vegetation along haul roads, as needed, to allow truck traffic.
8. At the end of the project, remove the rail line up to the main road, and restore the loading area and haul roads to the original condition (grading, restoring the fence). Due to minimal impacts, revegetation will be accomplished through natural reseedling. During the course of the removal project, if any release of waste occurs, a timely cleanup response will be conducted, as described in detail in the Work Plan. Trained personnel will take immediate actions. Actions will be taken to prevent further spread of contamination. All contaminated material will be removed and surveys performed to confirm the area is returned to background levels.

IV. Transportation Alternatives Considered

Several alternatives to the current proposed transportation plan were considered and found not to be feasible. In February 2000 it was proposed that the contaminated soil and debris from the BOMARC site be trucked to one of two nearby rail transfer facilities. The first site considered was the rail transfer facility located in the Borough of Lakehurst, New Jersey and the second site considered was the Heritage Minerals rail transfer facility located in Manchester Township. Local opposition from the mayors of these

communities to the movement of the contaminated soil and debris over public roads within the communities prompted the need to consider transportation of the BOMARC waste over non-public roads. Transportation to a rail transfer facility directly on Fort Dix was also not feasible in that it would have required construction of an estimated 8 miles of rail at a cost of \$3.6 million. Transportation via airlift from McGuire AFB was also considered, but found to be not economically feasible. This would require an estimated 320 C-5 Galaxy sorties at an estimated total cost of \$45 million. Further, maintaining the current access restrictions and management practices of the BOMARC site without removal of the contaminated soil and debris is also not a feasible option. This violates an agreement between the Air Force and the New Jersey Department of Environmental Protection that the contaminated soil and debris be removed. Moreover, leaving the contaminated soil and debris in place risks potential ground water contamination in the future.

V. Environmental Impacts of the Proposed Transportation Plan

The proposed transportation plan requires preparing a 50- by 900-foot truck-to-rail car transfer area on the east side of Hancock Road. This entails removing a few dozen-pine trees and performing grading and backfilling to accommodate the extension of the rail spur and a truck transfer area. The transport route and rail spur reconstruction require incidental clearing, backfilling, and grading to accommodate truck traffic. During the remediation project, periodic grading will be required to maintain the truck route. The trucks and equipment used will produce incidental air emissions over an estimated 6-month period.

1. Environmental Impacts of Improvements of Road Improvements

Most of the impacts and improvements will be on existing dirt or gravel roads such as Manahawkin Road and previously disturbed areas. Anticipated environmental impact consists of tree trimming to allow movement of trucks, grading, placement of geotextile material, and gravel. There will be some grading onto undisturbed areas, estimated to total less than 1,000 square feet, adjacent to existing roads. There is no anticipated impact on endangered plants or animals. Where needed to stabilize soft or loose road areas, porous geotextile (Mirafi 600X) fabric material will be spread on the road and covered by a 4- to 6-inch deep layer of road-base material approved by NJDOT (crushed concrete and recycled asphalt). An estimated 12,000-linear foot by 12-foot-wide geotextile material will be used.

2. Environmental Impacts of Reconstruction of Rail Spur and Construction of Commercial Gate

Most of the impacts and improvements will be on existing railroad bed and previously disturbed areas. Anticipated environmental impact consists of tree trimming/removal to allow placement/construction of rail spur and truck transfer area, grading, placement of geotextile material, and gravel. Anticipate removal of a few dozen-pine trees in a 1,200-square-foot area and grading of approximately a 50- by 900-

foot area for the rail transfer area. There will be some grading onto undisturbed areas, estimated to total less than 4,000 square feet. There is no anticipated impact on endangered plants or animals. Where needed to stabilize soft or loose road areas, porous geotextile (Mirafi 600X) fabric material will be spread and covered by a 4- to 6-inch deep layer of road-base material approved by NJDOT (gravel). Estimate using up to 300 linear feet of 18-foot-wide geotextile material. Approximately 870 feet of new track will be laid inside the fence of NAES Lakehurst on 18-inch ballast material. This will be removed at the completion of this project.

Structures on site will consist of a mobile container lifter, portable 8- by 25-foot office trailer, portable toilet, and a portable 25 KW generator. Fuel will be delivered frequently from off site to minimize on-site storage. There will be no connection to permanent utilities.

Minor air emissions anticipated from diesel engines on the crane and generator. Fugitive dust will be minimized by the application of water sprays, as needed. Water runoff will be controlled through the use of appropriate engineered barriers. Operations will produce noise typical of an industrial site. Normal traffic on Hancock Road will be diverted.

3. Environmental Impacts of Transporting Contaminated Soil and Debris Across Fort Dix and NAES Lakehurst

Minor air emissions anticipated from the diesel and gasoline engines on the trucks. This is not anticipated to be a significant increase in air emissions, based upon an anticipated 15 truck trips per day versus the average 200 trucks and thousands of cars per day, which currently transit NAES Lakehurst. Limiting vehicle speed will minimize fugitive dust and the application of water sprays, as needed. Operations will produce noise levels typical of previous usage.

4. Environmental Impacts of Construction of New NAES Lakehurst Commercial Gate

Anticipated environmental impact consists of excavating/grading, and minor tree trimming/removal to allow construction of roadway/gate system and placement of gravel and pavement. Anticipate excavation of 5,315 cubic yards of soil, clearing and grading. Project placement of 3,850 square yards of pavement. During construction, water runoff will be controlled with silt barriers. Water runoff will be engineered to minimize adverse impacts.

VI. Public Participation

While neither CERCLA § 117(c), 42 USC § 9617(c) nor the NCP, 40 CFR § 300.435(c)(2)(i), require a public comment period for an ESD, the Air Force as lead agency has decided public comment would be appropriate and beneficial. Therefore, the

public was invited to comment on the draft ESD. The public comment period began January 13, 2002 and ended February 12, 2002. One public comment letter to the draft ESD was received during the comment period. The three comments raised in that letter are addressed in the Responsiveness Summary, which is attached hereto. This ESD and the information upon which it is based have been included in the Administrative Record (AR) File and in the Informational Repository (IR) for the Site. The AR and the IR also includes the November 1992 ROD and all documents that formed the basis for Air Force's selection of the cleanup remedy for the BOMARC site. The AR is available for public review at the location listed below:

305 CES/CEV
2403 Vandenberg Avenue
McGuire AFB NJ 08641
(609) 754-2770

The IR is available for public review at the location below:

Burlington County Library
5 Pioneer Boulevard
West Ampton NJ 08060

Questions or comments on the Air Force's actions and requests to review the Administrative Record can be directed to:

Mr. King Mak
Remedial Project Manager
305 CES/CEVR
2403 Vandenberg Avenue
McGuire AFB NJ 08641
(609) 754-3323

Second Lieutenant Diane Weed
Chief of Public Affairs
2901 Falcon Lane
McGuire AFB NJ 08641-5002
(609) 754-6855

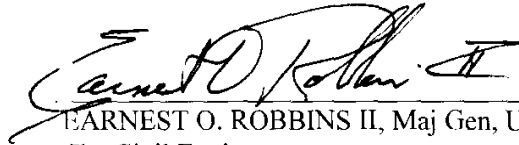
VII. Support Agency Review

The Air Force has notified the USEPA and NJDEP of the changes proposed in this draft ESD in accordance with 40 CFR § 300.435(c)(2). We have solicited for their Support Agency review and comments. No Support Agency comments were received during the public comment period.

VIII. Affirmation of Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the scope of the selected remedy, the Department of the Air Force has determined that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the proposed revised remedy utilizes permanent solutions and alternative transportation options to the maximum extent practicable at the BOMARC Site and otherwise complies with all applicable statutory requirements of CERCLA Section 121, 42 USC § 9621.

Date: 30 April 02


EARNEST O. ROBBINS II, Maj Gen, USAF
The Civil Engineer
DCS/Installations and Logistics